

## Intel® Wi-Fi 6 AX201 (Gig+) Module

Nearly 3X higher peak data rates and up to 4X capacity



The Intel® Wi-Fi 6 AX201 (Gig+) adapter is a CRF<sup>1</sup> (Companion RF) module that supports the new IEEE 802.11ax standard – Wi-Fi 6 technology and is Wi-Fi CERTIFIED 6™<sup>2</sup>. The product supports 2x2 Wi-Fi 6 technology, including new features such as UL and DL OFDMA and 1024QAM, delivering data rates of up to 2.4Gbps<sup>3</sup> and increased network capacity as well as Bluetooth® 5.2 support. These new features deliver a significant improvement in user experience in dense deployments, supporting fast uploads and downloads, lower latency, and longer battery life compared to solutions supporting 802.11ac. Combined with Intel® Core™ processors and exceptional Intel wireless innovations, the Intel® Wi-Fi 6 AX201 module can provide Gigabit wireless speed<sup>3</sup> and dramatically improve your connected experience at home, work, or on the go.

### 1<sup>st</sup> Generation Intel Wi-Fi 6 Wireless

<p><b>Increased Capacity</b> <b>Faster Speed</b> <b>Better Coverage</b> <b>Extended Battery Life</b> <b>802.11ax Dual Band 2x2 160MHz</b> <b>Improved Security</b></p>	<p>By implementing the new 802.11ax standard, with its unique features such as OFDMA, 1024QAM, Target Wake Time (TWT), and spatial reuse, the Intel® Wi-Fi 6 AX201 module enables smooth streaming of high resolution videos, fewer dropped connections, and faster connections farther away from the router and in dense environments.</p> <p>When using Wi-Fi 6 technology with 1024QAM and 160MHz channels, the Intel® Wi-Fi 6 AX201 module can deliver nearly 3x higher peak data rates<sup>4</sup> (up to 2.4Gbps) and up to 4x capacity improvement in dense or congested environments compared to 802.11ac<sup>5</sup>.</p> <p>Intel® Wi-Fi 6 AX201 module supports the new WPA3* security features, enabling next-generation authentication and military-grade encryption.</p>
<p><b>Bluetooth® 5.2</b></p>	<p>Bluetooth® 5.2 provides 4x<sup>6</sup> range over Bluetooth® 4.2 using the same Tx power, enabling coverage throughout the home. Bluetooth® 5.2 also doubles data rate speed for faster transmissions, thereby reducing the overall power consumption<sup>6</sup>. Additionally, Bluetooth® 5.2 adds new, enhanced data broadcasting, enabling seamless location-based services and simpler pairing for Bluetooth® devices.</p>
<p><b>Microsoft Windows 10*</b></p>	<p>Full support for the latest Microsoft Windows 10* OS.</p>
<p><b>Form Factors</b> <b>(M.2 2230 and 1216)</b></p>	<p>M.2 2230 modules enable system configuration and platform usage flexibility with the use of a standard Key E socket for attaching the module.</p> <p>M.2 1216 modules enable platform design optimization with the use of an Intel CNVio interface between the CNVi<sup>7</sup> and Intel® Wi-Fi 6 AX201 module<sup>8</sup>, providing savings on motherboard space, BOM and PCIe* port, plus allowing for flexible motherboard routing up to 10".</p>

## Experience the Intel® Difference

<b>Worldwide Regulatory Support</b> <b>Intel® Dynamic Regulatory Solution</b>	Enables performance optimized worldwide regulatory compliance SKU. The Intel® Wi-Fi 6 AX201 module detects its location and automatically optimizes the Wi-Fi settings to local regulatory requirements, maximizing performance in each geography, simplifying travel experience and global enterprise procurement. Future regulatory changes are easily managed during the product life cycle.
<b>Wireless Functionality in Pre-boot Environment</b>	Support for Wi-Fi network and Bluetooth® Low Energy Human Interface Device (HID) connectivity in the platform's UEFI (Unified Extensible Firmware Interface) environment during its boot stage. This capability enables use cases like OS recovery over Wi-Fi and Bluetooth® Low Energy-based keyboard and mouse connectivity in this pre-boot environment.
<b>Wirelessly Project to the Big Screen</b>	Project your 2-in-1 or laptop content instantly, without wires, on the big HD screen with stunning image clarity and sound using Wi-Fi Miracast*. Stream movies, videos, games, photos, connect with friends, and more. Experience it all, bigger and better than ever before.

## Business-Class Wireless

<b>Intel® vPro® Technology<sup>9</sup></b>	Supports Intel's hardware-based security and management features built into Intel® Core™ vPro® processors and chipsets that enable IT to manage PCs virtually anywhere, anytime, while reducing deployment costs, improving security and ROI.
<b>Intel® Active Management Technology<sup>10</sup></b>	Using integrated platform capabilities and popular third-party management and security applications, Intel® AMT allows IT or managed service providers to better discover, repair, and help protect their networked computing assets. Intel® AMT is a feature of Intel® Core™ processors with Intel® vPro® technology.

## Intel® Wi-Fi 6 AX201 Technical Specifications

### GENERAL

Dimensions (H x W x D)	M.2 2230: 22mm x 30mm x 2.4mm [1.5mm Max (Top Side)/ 0.1mm Max (Bottom Side)] M.2 1216: 12mm x 16mm x 1.65 (+-0.05)mm
Weight	M.2 2230: 2.33 +/- 0.3 g M.2 1216: 0.61 +/- 0.1 g
Radio ON/OFF Control	Supported
Connector Interface	M.2: CNVio2 <sup>11</sup>
Operating Temperature (Adapter Shield)	0°C to +80°C
Humidity Non-Operating	50% to 90% RH non-condensing (at temperatures of 25°C to 35°C)
Operating Systems	Microsoft Windows 10*, Linux*, Chrome OS*
Wi-Fi Alliance <sup>12</sup>	Wi-Fi CERTIFIED* 6, Wi-Fi CERTIFIED* a/b/g/n/ac, WMM*, WMM*-Power Save, WPA2*, WPA3*, WPS*, PMF*, Wi-Fi Direct*, Wi-Fi Agile Multiband* and Wi-Fi TimeSync*
IEEE WLAN Standard	IEEE 802.11-2016 and select amendments (selected feature coverage) IEEE 802.11a, b, d, e, g, h, i, k, n, r, u, v, w, ac, ax; Fine Timing Measurement based on 802.11-2016
Bluetooth®	Bluetooth® 5.2

### SECURITY FEATURES<sup>13</sup>

Security Methods	WPA2* Personal and Enterprise; WPA3*
Authentication Protocols	802.1X EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0 -MSCHAPv2 (EAP-SIM, EAP-AKA, EAP-AKA')
Encryption	64-bit and 128-bit WEP, TKIP, 128-bit AES-CCMP, 256-bit AES-GCMP

### COMPLIANCE

Regulatory	For a list of country approvals, please contact your local Intel representatives.
US Government	FIPS <sup>14</sup> 140-2
Product Safety	UL, C-UL, CB (IEC 60950-1)

Product Name	Model Number	Version
Intel® Wi-Fi 6 AX201	AX201NGW	Wi-Fi 6 (802.11ax), 2x2, Bluetooth® 5.2, M.2 2230
	AX201D2W	Wi-Fi 6 (802.11ax), Bluetooth® 5.2, M.2 1216
	AX201D2WL	Wi-Fi 6 (802.11ax), Bluetooth® 5.2, M.2 1216; LTE Coex

For more information on Intel® Wireless products, visit [intel.com/wireless](https://www.intel.com/wireless)



<sup>1</sup> CRF: Companion RF module in M.2 form factor.

<sup>2</sup> Wi-Fi 6 (802.11ax) WFA certification is available since September 2019.

<sup>3</sup> Based on the theoretical maximum bandwidth enabled by 2x2 802.11ax 160MHz implementations. Actual wireless throughput and/or range will vary depending on your specific operating system, hardware and software configurations. Check with your device manufacturer for details.

<sup>4</sup> "Nearly 3X higher peak data rates" Intel® Wi-Fi 6 AX claims are based on the comparison of the expected maximum theoretical data rates for similarly configured 802.11ax and standard 802.11ac Wi-Fi solutions as documented in IEEE 802.11ax draft 2.0 spec and IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ax wireless network routers.

<sup>5</sup> In accordance with the IEEE 802.11ax PAR. For additional details, visit: <https://mentor.ieee.org/802.11/dcn/14/11-14-0165-01-0hew-802-11-hew-sg-proposed-par.docx>.

<sup>6</sup> Bluetooth® 5.2 Feature overview, [https://www.bluetooth.com/wp-content/uploads/2020/01/Bluetooth\\_5.2\\_Feature\\_Overview.pdf](https://www.bluetooth.com/wp-content/uploads/2020/01/Bluetooth_5.2_Feature_Overview.pdf). Only mandatory features are supported.

<sup>7</sup> CNVi; Refers to the integrated wireless IP portion residing in the Intel® SOC/PCH.

<sup>8</sup> Integrated: Solution comprised of CNVi and a CRF.

<sup>9</sup> Intel® vPro® Technology is sophisticated and requires setup and activation. Availability of features and results will depend upon the setup and configuration of your hardware, software and IT environment. To learn more visit: <http://www.intel.com/technology/vpro>.

<sup>10</sup> Requires activation and a system with a corporate network connection, an Intel® AMT-enabled chipset, network hardware and software. For notebooks, Intel® AMT may be unavailable or limited over a host OS-based VPN, when connecting wirelessly, on battery power, sleeping, hibernating or powered off. Results dependent upon hardware, setup and configuration. For more information, visit <http://www.intel.com>.

<sup>11</sup> The CNVio signals connect the CRF module and the CNVi IP in the Intel® SoC/PCH. The CNVio protocol is Intel® proprietary.

<sup>12</sup> Support of Wi-Fi Alliance certifications is OS-dependent.

<sup>13</sup> Some security solutions may not be supported by your device operating system and/or by your device manufacturer or may require additional hardware (e.g., UICC – SIM card). Check with your device manufacturer for details on availability.

<sup>14</sup> On Microsoft Windows 10\*.

The Bluetooth® word mark and logos are registered trademarks owned by the Bluetooth SIG, Inc. and any use of such marks by Intel Corporation is under license.

Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks).

Estimated results were obtained prior to implementation of recent software patches and firmware updates intended to address exploits referred to as "Spectre" and "Meltdown". Implementation of these updates may make these results inapplicable to your device or system.

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document.

Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade. Intel may make changes to specifications and product descriptions at any time, without notice. For the most current product information, please visit <http://www.intel.com/wireless>.

Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

Intel, the Intel logo, are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.

Copyright © Intel Corporation. All rights reserved.